DESIGN CHECKLIST

The following checklist is a summary of requirements contained in Section 1 of the FSDCO and of issues encountered on previous projects. It is intended to be a in-process check for the Project Manager. As a continually evolving instrument, new items will be added from every project. Project Managers are encouraged to make changes, additions and deletions.

PHASE CHECK				ITEM	
PGM	SD	DD	CD	#	ITEM
				0	**ADMINISTRATIVE**
				0.1	Provide P.M. a summary of design decisions
				0.2	Deviations from codes agreed to in writing by the Project Manager with written concurrence from the related regulatory agency
				0.3	Field-verify all reference information and purported as-built conditions
				0.4	Identify and evaluate any necessary alternates early in the design process
				0.5	Produce planned schedule for the construction sequence
				0.6	Provide room data sheets for all mechanical spaces
				0.7	Provide room data sheets for all electrical spaces
				0.8	Verify that project has achieved minimum LEED Silver Rating.

PHASE CHECK				ITEM	
PGM	SD	DD	CD	#	ITEM
				1	**GENERAL DESIGN**
				1.1	Consider crime prevention in the development of the overall design.
				1.2	Include appropriate seismic provisions
				1.3	Provide acoustic management of noise sources
				1.4	Assure design meets Chapter 11 of State U.B.C.
				1.5	Convene accessibility focus group and review design for providing access without bringing special attention to the disabled individuals.
				1.6	Locate service elevator with adjacent custodial delivery and storage room (200 sf minimum).
				1.7	Make provision for site waste collection
				1.8	Insure recycle space requirements per SMC Sections 23.47.029, 23.48.031, and 23.49.015
				1.9	Pair of green chutes if greater than one story
				1.10	Provide a minimum of one custodial closet per floor
				1.11	Locate mechanical service entrance room in the basement, adjacent to the utility connection
				1.12	Locate mechanical services distribution within the building shall be via readily accessible pipe and duct shafts.
				1.13	Insure vehicle idling areas are separate from outdoor air intakes
				1.14	Locate electrical service entrance room in the basement, adjacent to the utility connection
				1.15	Provide independent electrical closets provided, minimum 1 per floor
				1.16	Locate main telecommunications distribution room in the basement or on a lower level
				1.17	Provide distribution rooms (minimum 1 per floor) stacked vertically.

				1.18	Provide computer/server room adjacent, but separate from, the main distribution room.
				1.19	Provide separate battery/UPS room, vented.
				1.20	Provide one conference room (minimum) with interactive video equipment.

PHASE CHECK				ITEM	
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				2	**SITE & UTILITIES**
				2.1	Review anticipated vehicular and pedestrian routings, and emergency and maintenance access requirements.
				2.2	Minimize service access conflict with access for disabled persons
				2.3	Provide 2 loading stalls, 10 ft minimum width.
				2.4	Space for three standard dumpsters
				2.5	driveway access to dumpsters with 35 ft level area
				2.6	Verify sizes of waste and recycling containers.
				2.7	All dumpsters, and compactors to be accessible using wheeled pushcarts and waste containers
				2.8	Minimum of 60’ pick-up clearance in front of waste containers
				2.9	Cover/canopy at service area with anti-roost provisions
				2.10	Concrete walls/screening surrounding service area
				2.11	Insure catch basins and drains are protected from wind driven trash and debris
				2.12	Maximum loading dock height of four feet.
				2.13	Spring loaded levelers or scissors lift @ loading docks
				2.14	Meet DOT highway standard for clearances at loading docks/service areas
				2.15	21 ft minimum overhead clearance at dumpsters.
				2.16	Level access for maximum length vehicles
				2.17	Weather protected enclosure/cover at loading dock/area
				2.18	Obtain City approval for pumping of sewage or storm drainage if proposed
				2.19	Provide separate sanitary sewer and storm drainage systems.
				2.20	Provide separate domestic and fire protection water service.
				2.21	Automatic irrigation using non-potable water at all landscaping associated with the building.
				2.22	Design pedestrian pathways, plazas, etc., for H-20 vehicular loads
				2.23	All sidewalks and walkways constructed of 2" of asphalt concrete paving over a 2" compacted crushed rock base.
				2.24	Walkways doubling as service access ways constructed of 3" of asphalt concrete paving over a 4" compacted crushed rock base.
				2.25	All roads, streets and driveways constructed of 3" of asphalt concrete paving over a 4" compacted crushed rock base.
				2.26	All parking areas constructed of 3" of asphalt concrete paving over a 4" compacted crushed rock base.
				2.27	All patching of existing asphalt paved surfaces shall be to match the existing paving thickness (depth).
				2.28	All overlays of existing asphalt paved surfaces specified for thickness (depth) and class of asphalt.

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				3	**CONCRETE**
				3.1	Standardize bar grades, sizes and lengths as far as possible.
				3.2	Beam and girder sizes and spacings uniformly chosen.
				3.3	Maintain column cross-sectional areas constant for at least two stories. When necessary, change column thickness only with an inside face setback
				3.4	Free standing interior columns should be circular and of constant diameter per story.
				3.5	Reinforce with spiral hoops rather than with isolated ties.
				3.6	Provide the maximum reuse of forms for all cast-in-place concrete work
				3.7	Minimal dimensions of column and beam sides should be in multiples of 2 inches.
				3.8	Locate cold joints so that shoulders are available to anchor subsequent concrete lifts.
				3.9	Provide keyways at all construction joints and include continuous water stops wherever subjected to hydrostatic pressures.
				3.10	Slope the top of all exposed concrete surfaces and include drip grooving underneath all cantilevered leading edges.
				3.11	Major transitions in section, such as occurs at a tunnel/building interface, shall be squared-off and isolated.
				3.12	Provide a bossed wall opening to support and laterally restrain the tunnel end. Allow for differential tunnel movement and water stop if necessary.
				3.13	All below grade exterior wall pipe penetrations made with special cast iron flange to mechanical joint wall castings of matching length with integral intermediate flange
				3.14	Sleeve and curb all floor slab openings
				3.15	Use fly ash as a direct substitute for Portland cement in mix quantities of 20% to 30% of the weight of cement

PHASE CHECK				ITEM	
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				4	**MASONRY**
				4.1	No masonry units used below grade.
				4.2	Masonry roof parapets roof face protected
				4.3	Expansion/contraction joints, sealed to prevent weather and water from penetrating to the interior of the building.
				4.4	Vertical and horizontal joints drained to daylight above all horizontal surfaces
				4.5	Primary (architectural) weather seal and a secondary weather seal where water and moisture could penetrate the wall.
				4.6	Stainless steel or copper thru-wall flashing at wall caps, window heads, ledger angles, base bearing, etc

PGM	**SD**	**DD**	**CD**	**#**	**ITEM**
				5	**METALS**
				5.1	Control web buckling by selecting appropriate beams rather than stiffening the web panel.
				5.2	ASTM490 high alloy strength bolts for high strength steel jointing.
				5.3	same bolt size throughout job with constant 3-inch spacing.
				5.4	Weld rigid frame connections for full ductile frame action under seismic loading.
				5.5	Butt (grooved) welded joints subject to impact and fatigue.
				5.6	Fillet weld for static loads only.
				5.7	Design welds for transverse loading rather than longitudinal shear whenever possible.
				5.8	Avoid weld combinations of higher strength steels in thicker sections, requiring a large amount of weld material and joint restraint.
				5.9	Avoid embrittling weldments perpendicular to rolled surfaces whenever possible
				5.10	Studs 1/2-inch and over annealed to induce stress relief during cooling.

PHASE CHECK				**ITEM**	
PGM	**SD**	**DD**	**CD**	**#**	**ITEM**
				6	**WOOD**

PHASE CHECK				**ITEM**	
PGM	**SD**	**DD**	**CD**	**#**	**ITEM**
				7	**THERMAL/MOISTURE**
				7.1	Minimize roof penetrations
				7.2	Positive drainage of water from roofing surfaces, decks, plaza areas, building periphery, etc.
				7.3	Roof decks with minimum of 1/4" per foot slope to drain, to the exterior of the building where possible.
				7.4	Exposed through-wall scupper systems
				7.5	Interior drains at points of maximum deflection of the roof structural deck, off of center line so as not to interfere with columns, beams and bearing walls.
				7.6	All drains located in sumps and flashed with 4 lb. per square foot lead.
				7.7	All joints where movement is anticipated have a primary and a secondary barrier which is drained to the exterior at all transition points.
				7.8	Interior gutter with drain system that drains to the exterior at all horizontal expansion joints.
				7.9	Minimum 8" curb above the membrane plane at expansion joints.

PHASE CHECK				ITEM	
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				7.10	Counter flashing extends down and covers a minimum of 1" of any adjacent materials.
				7.11	Parapets with roof base and reinforcing extended up a minimum of 1'-0" with clamp bar and adequate cover of flashing.
				7.12	Coping have adequate flashing coverage
				7.13	Penthouse walls roof base and reinforcing extend up a minimum of 1'-0" with clamp bar and adequate flashing
				7.14	Skylights/roof hatches curbs extend a minimum of 1' above the adjacent membrane surfaces
				7.15	Crickets on the upslope side of all perpendicular roof penetrations
				7.16	Vibration dampening, concrete slabs as well as vibration isolation mechanisms for support of all roof-top equipment
				7.17	Direct access from within the structure to penthouses.
				7.18	Float planters (if any) above roofing membrane

PHASE CHECK				ITEM	
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				8	**DOORS/WINDOWS**
				8.1	Include automatic door at the principal and major secondary entrances
				8.2	Confirm keying requireents and security requirements

PHASE CHECK				ITEM	
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				9	**FINISHES**
				9.1	Heavy duty floor and wall surfaces with protective wainscots and bumper guards on corners at service entrances

PHASE CHECK				ITEM	
PGM	SD	DD	CD	#	ITEM
				10	**SPECIALITIES**

PHASE CHECK				ITEM	
PGM	SD	DD	CD	#	ITEM
				11	**EQUIPMENT**

PHASE CHECK				ITEM	
PGM	SD	DD	CD	#	ITEM
				12	**FURNISHINGS**

PHASE CHECK				ITEM	
PGM	SD	DD	CD	#	ITEM
				13	**SPECIAL CONSTRUCTION**

PHASE CHECK				ITEM	
PGM	SD	DD	CD	#	ITEM
				14	**CONVEYING**
				14.1	Review anticipated traffic volume and type of use, handicapped access, and appropriate elevator locations.
				14.2	Location and isolation of machinery spaces reviewed to assure adequate sound attenuation.

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				15	**MECHANICAL**
				15.1	Insure that supply air intakes and exhaust fan discharges are coordinated against cross contamination
				15.2	Insure roof drains, footing drains, and area drains connected to the storm drainage system.
				15.3	Check accessibility to service distribution systems.
				15.4	Include sprinkler fire protection systems throughout
				15.5	Include hot and cold water service with hose-reel at service area
				15.6	Sound insulation in mechanical room walls
				15.7	Insure potable and non-potable water systems isolated by dual backflow prevention devices.
				15.8	Include central distribution system for hot water heated with low pressure steam
				15.9	Use mixed ventilation with temperature controlled exhaust fans and operable windows if feasible
				15.10	Provide gravity/ natural convection ventilation for heat producing and/or heat sensitive electrical equipment. Provide heat gain calculations for space involved to verify adequate ventilation.
				15.11	Insure there is no piping in transformer vaults and main switchgear areas.
				15a	**INDOOR AIR QUALITY**
				15a.1	Develop and implement an Indoor Pollutant Source Control Plan
				15a.2	Develop a Ventilation Control Plan
				15a.3	Develop a building indoor Air Quality Operations plan
				15b	**LIFE CYCLE COST ANALYSIS**
				15b.1	Prepare ELCCA work plan
				15b.2	Provide ELCCA analysis and obtain approval.
				15c	**ENERGY MANAGEMENT/COMMISSIONING AND PERFORMANCE MEASUREMENT AND VERIFICATION**
				15c.1	Participate in development of design and construction documents
				15c.2	Review, comment upon, and recommend language for Building Commissioning
				15c.3	Prepare design baseline for Measurement and Verification Protocol
				15c.4	Provide computer-aided analytical analysis and estimate of energy performance
				15c.5	Develop Measurement and Verification Plan

PHASE CHECK				ITEM	
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				16	**ELECTRICAL**
				16.1	Confirm service conductor taps and service classifications
				16.2	Building service room contains the primary interrupter switch, the service transformer, and the service switchboard
				16.3	Approval of distribution concepts including grounding, calculated fault duties and protective relay coordination methods with Plant Engineering and plant electricians
				16.4	Submit connected and demand load calculations for power system
				16.5	Prepare a short circuit study and evaluate potential coordination and interrupting capacity problems
				16.6	Review electrical room locations, sizes, and equipment arrangements
				16.7	Electrical rooms and closets located on each floor with risers in direct vertical alignment
				16.8	Confirm requirements for spare parts inventories
				16.9	Confirm emergency lighting and power system requirements
				16.10	Approval of switchgear
				16.11	Insure adequate size of electrical rooms to accommodate the immediate and / or future installation of on-site co-generation of power.
				16.12	Obtain City approval of all loads added to the emergency power system
				16.13	Design for future removal or replacement of transformers
				16.14	Provide supports and restraints for Seismic Zone III requirements for all equipment and raceways
				16.15	Allocate floor space for future switchgear.
				16.16	Equipment clearances in excess of NEC for safety and maintenance convenience
				16.17	No heat sensitive equipment or equipment requiring working clearance above transformers.
				16.18	Identify type of control for every motor in the specifications or on the drawings.
				16.19	Coordinate sontrols in motor control centers with mechanical engineer for compatibility with the control requirements.
				16.20	Coordinate locations of remote and central control and annunciation panels with Plant Engineering.
				16.21	Lighting fixtures and controls approved by electrical department
				16a	**TELECOMUNICATIONS**
				16a.1	Telecommunications provisions reviewed by ESD Communications engineer
				16B	**COMMISSIONING**
					Lighting controls commissioned to ensure control devices, components, equipment, and systems are calibrated, adjusted, and operate in accord with approved plans and specifications. (See Seattle Energy Code Section 1513.7)

End of Appendix 1 - M